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1984 Review

1985

Concrete industries play major role in construction gains

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The concrete industries—the year past, the year ahead

By Patricia Murphy

Respondents to our annual survey of the concrete industries are reporting a second year of survival of the economic fire storms that wracked the early '80s. Like pioneers emerging cautiously from the circle of wagons after beating back the "hostiles," producers in all the industries served by *Concrete* feel able to take a few deep breaths, based on 1984's improved volume picture, but still have rifles at the ready in anticipation of 1985.

"If" is the word most frequently used by those answering our questions concerning 1985--"if" interest rates drop further, "if" housing, highway, and other construction markets truly improve, "if" the economy indeed stabilizes, then 1985 will be a good year.

Questionnaires returned by hundreds of ready-mix, masonry, precast and prestressed, and pipe producers portray encouraging rises in production volumes--20% for pipe producers, 21% for precasters, 22.4% for masonry producers, 25.9% for the ready-mix industry, and 32% for prestressers. Compared to the answers of our 1983 respondents, the gain assuredly is heartening; last year, volume increases over the previous year ranged from 10% to 22%. In each segment of *Concrete's* readership, producers reporting 1984 increases in business dominated the field of survey--70% in masonry and prestressed, 65% in pipe, 64.9% in ready-mix, and 62% in precast.

Regarding 1985, precasters are the most optimistic; 70% anticipate an average gain of 16.6%. More than 58% of the prestressers responding to the survey expect 1985 production levels to be up by an average of 14.2%. Slightly more than 46% of the masonry producers are looking for an average gain of 14.6% in 1985. Ready-mix producers and pipe manufacturers are the most cautious--38.3% of those answering the ready-mix survey anticipate an average increase of 13% while 37% of the pipe producers look for production gains in 1985 that will average 11%. As in past years, *Concrete's* survey included queries regarding the cost of doing business, the percentage of price increases, and investment plans for 1985 in plant and equipment. The information submitted by the producers was tabulated by industry and appears in staff-prepared reports in this section.

Once again, we find it our pleasant duty to thank our readers for their continued cooperation in responding to this annual canvass--the only one of its type for ready-mix, masonry, precast and prestressed, and pipe producers. We can assure all those who took the time to answer and return our questionnaire that the information is valued by us and by others who track the health of the concrete construction industry. We also are indebted to the staff leaders of the several national industry associations who annually provide us with commentaries on conditions in the industries they serve. ●

1984 construction gains to slow in first half of '85

By J. G. Kostka

Riding the upward surge it has experienced the past 2 years, construction continued to climb during the first half of 1984. An 11% prime interest rate during the first quarter contributed greatly to the continued gain. Then in April the prime rate rose to 11.5%; by July it had reached 13%, where it remained until September.

This 2% rise was enough to put the brakes on the momentum construction had developed. Although money still was available for loans, the cost to borrow was higher. This caused some prospective construction projects to be shelved until it would be less expensive to borrow money.

In September, the prime rate began to drop and reached the 11.75% level by November. A number of bank economists feel that it will have continued to decline and by the end of the year have reached the 11% mark it was at early in 1984. This feeling is based on the fact that inflation has been held down to an annual rate of about 4% and the Gross National Product figures have shown only a very modest increase. All of which indicates no further need to raise interest rates to curb inflation.

According to George A. Christie, McGraw-Hill Information Systems vice president and chief economist, reporting in the *1985 Dodge/Sweet's Construction Outlook*, 1984 construction amounted to approximately $211.15 billion. Because of the relatively low rate of inflation, virtually all of this figure represents actual physical construction put in place.

Construction in 1985, according to Christie, will decline slightly to $210.975 billion. Evidently the 13% prime rate in mid-1984 was a strong enough deterrent to affect the outcome of construction in 1985, when the first half of the year is expected to start out slowly, then begin to pick up momentum during the last half. If, however, the prime rate should drop below the anticipated 11% level, the recovery process could be speeded up considerably.

Against the background of total construction figures, here is what the *Dodge/Sweet's Construction Outlook* forecasts for the major construction sectors in 1985.

Housing

Individuals are most directly and economically affected by rising interest rates. As a consequence, they react to them rather quickly. This is borne out by the fact that the value of construction for one-family houses totaled $66.75 billion in 1984, and is expected to drop to $65.925 billion in 1985--the year following the jump in the prime rate.

Construction of one-family houses in 1984 totaled 1.1 million physical units, while in 1985 an estimated 950,000 will be constructed. This is a decline of 13.6% over the previous year. Prospects for 1986 look brighter, and construction of this type should reach 1.05 million units.

Construction of multi-family houses in 1984 was valued at $28.25 billion. The figure for 1985 should be around $25.825 billion. This amounts to a decline of 8.6%. There were 760,000 multi-family housing units constructed in 1984. In 1985, the total is expected to be 650,000 units, a decline of approximately 14.5%.

During the past 6 years there has been an outstanding increase in multi-family houses, rising from 30% to 43% of the total housing starts. One of the main reasons for the switch to multi-family houses was that condos were more affordable than prohibitively priced single family houses.

Since 1983, the Economic Recovery Tax Act (ERTA) has been responsible for channeling additional capital into the construction of apartments, permitting this type of building to enjoy the advantages of tax-sheltered investment by means of ERTA's liberalized depreciation allowance. It is questionable, however, how long this advantage will continue because it exists only at the pleasure of Congress and the IRS, and could be discontinued at

any time.

Non-housekeeping residential construction totaled $7.15 billion in 1984 and should amount to $6.75 billion in 1985, indicating a decline of 5.6%. This represents the smallest drop in the housing construction sector.

All sections of the U.S., except the Northeast, are expected to experience a decline in the value of residential construction in 1985. The North Central will be down about 3%, the South will drop around 6%, and the West will show about a 2% decline. The Northeast is expected to remain at about the same level in 1985 as in 1984.

Non-residential buildings

Being largely dependent upon home building, non-residential building is expected to be somewhat curtailed in 1985. Commercial and manufacturing construction, which amounted to $47.55 billion in 1984, will ease downward 1.3% to $46.925 billion in 1985. Institutional and other non-residential building construction will enjoy a better fate by climbing from $24.675 billion in 1984 to $26.375 billion in 1985, a gain of 6.9%.

Stores, other commercial buildings

Construction of stores and offices closely follow housing construction. This is supportive construction necessary to help maintain the day to day life in a community. Because of its close correlation to housing construction there appears to be little hope for the expansion of retail building until the housing market springs back.

On a footage basis, retail building amounted to 405 million sq. ft. in 1984. It is anticipated that this segment of construction will wind up with a total of 410 million sq. ft. in 1985.

Due to the anticipated 1985 turnaround in housing starts, contracting for stores and other commercial buildings should advance during the early part of 1986.

Office buildings

For a number of years office building construction supported the entire construction market. It reached its peak in 1981 when the third quarter contracting of that year reached a rate of 351 million sq. ft. In 1982 and 1983, the contracting rate for office space construction eased off to a more realistic rate of 250 million sq. ft., but it now appears the 1984 rate will be close to the all-time high of 1981.

There have been a number of reasons for the high rate of office building construction, such as: growth in the number of office workers employed, allotment of more space per worker, relocation of companies, and replacement of buildings no longer suitable for use due to obsolescence or destruction by fire.

One of the main reasons for the need for more floor space per worker is the need to make room for high tech office equipment that has been entering the business field in recent years. Another reason is the shift in office location. For a number of years there has been a strong exodus of businesses from the northern states to the Sunbelt states. The boom that began in the Southwest appears to be slowing down, since the Northeast and Midwest recently have experienced increased demands for office construction.

Although it is realistic to assume that an excessive amount of office space now exists, construction of this type continues at a high level because of a real estate tax shelter, the ERTA, that provides the benefit of accelerated depreciation. Many investors have found this type of investment relatively safe so they have continued to provide their financial support.

Institutional building

It has been 14 years since there has been any signs of increases in institutional building construction. This segment of the construction industry reached its peak in 1970 when contracting was 400 million sq. ft. per year by the end of the decade. A further decline developed in the early 1980s due to federal budget cuts, extremely high interest rates, and the erosion of tax revenues caused by the recession. This caused institutional building construction to fall to only 256 million sq. ft. by 1982.

Now, it looks as though the long decline of institutional building finally may be turning around. The long downward trend appears to have stopped, and the prospects for a resurgence in institutional construction in the coming years looks good.

School enrollments are on the rise, but, for the time being, students are occupying empty desks. It shouldn't be too long, however, before there will be a need for additional seating capacity so more schools will have to be built to satisfy the growing need.

Now that educational building construction no longer is a minus factor, the modest growth potential for several other categories of institutional building is becoming dominant. With an expected 5% increase to 280 million sq. ft. in 1985, this year may see the start of a rising trend of contracting that will bring

New construction in place
(Annual value in billions of 1977 dollars)

	Actual					Forecast	
	1979	1980	1981	1982	1983	1984	1985
Total new construction	179.0	161.1	157.6	150.6	167.2	182.0	185.0
Private	141.4	123.6	122.4	116.9	134.1	148.1	148.2
New housing units	60.3	44.1	40.5	32.8	52.6	61.0	55.0
Nonresidential building	36.1	35.4	39.4	41.9	38.8	43.2	46.0
Industrial	11.4	9.4	11.0	11.1	8.4	9.0	10.5
Office	7.2	9.0	11.3	14.8	13.8	12.5	12.0
Other commercial	11.8	11.2	10.9	9.1	9.3	10.6	11.6
Hospital/institutional	2.7	2.7	3.2	3.8	4.2	4.4	4.4
Public	37.6	37.5	35.1	33.7	33.1	33.9	36.8
Public building	11.9	12.5	11.5	10.9	10.9	10.4	10.9
Highways/streets	8.6	8.5	8.6	9.1	9.7	11.0	12.0
Military facilities	1.2	1.3	1.3	1.4	1.6	1.9	2.0
Conservation/development	3.8	3.8	3.7	3.3	3.2	2.9	3.4
Other public**	12.0	11.5	10.1	8.9	7.7	7.7	8.5

* Includes warehouses, grain elevators, silos, department stores, parking structures and miscellaneous other commercial buildings.
** Includes sewer systems, water supply facilities and other open construction.

Source: Bureau of the Census and PCA reports

the annual total of institutional building to 300 million sq. ft. before the end of this decade.

Public works

Aided by the Surface Transportation Assistance Act passed in 1983, taxing motor fuel 5 cents-per-gallon and alloting 80% to highway and bridge construction, construction in this category was pushed up to $17.3 billion in 1984. Continued gains are foreseen for 1985 when the total for the year climbs to an estimated $18.5 billion for a gain of 7%.

Our highways and bridges have been neglected for a prolonged period of time, so it appears likely construction in this segment will continue to escalate to bring these facilities back to a satisfactory condition. In addition, there also will be a need for the construction of new roads and bridges to meet the travel needs of a constantly shifting population.

All other public works construction totaled $15.975 billion in 1984. A small gain of 4.4% is looked for in this segment in 1985, bringing the annual total up to $16.675 billion.

Utilities

When housing construction rises, utility construction follows the same pattern. The advance in housing construction during the past 2 years has created a greater demand for utilities and, as a consequence, utility construction should rise from $3.5 billion in 1984 to an expected $4 billion in 1985 for a healthy gain of 14%.

Since construction operates on a 5- or 6-year cycle, the current cycle is only about half finished. It is felt that the pause in 1985, when there will be no marked gain or loss, will be only a temporary situation and an upward trend will be resumed in 1986 and continue for another 2 or 3 years. ●

Views of national association leaders:

CONCRETE BLOCK: a market outlook

Paul Leuchuk
President
National Concrete Masonry Association

The long recession for the concrete block industry, starting in late 1979, came to an end for most of the industry by the beginning of 1983. By 1984, shortages of masons began to develop and a number of block companies reported their best sales ever.

Unfortunately, some parts of the country, especially those dubbed as being in the "Rust Belt," while experiencing a recovery, have not yet been blessed with business they could not handle.

Since 1979 about 200 block plants have closed their doors permanently. There have been a large number of changes in ownership and consolidations. The two-at-a-time block machine plant is becoming extinct.

During the same period, the customized block market has had a rapid increase in business and now accounts for approximately 15% of all sales. The paving block market also is expanding although at a much slower rate. It now represents less than 1% of the sales dollars for concrete masonry, but definitely is in its early growth phase.

The passive solar market as it applies to single family homes has not realized its potential. There are two restraints to its growth--the lack of an energy crisis and the fact that it needs a great deal of personal promotion on a local level to succeed. Homebuilders of tract homes have not accepted passive solar energy as a means for reducing energy bills and there are few incentives in the energy codes or in tax credits for them to do so.

Some of the threats to concrete block markets have diminished. Wood basements have not made significant sales gains. The publicity on their use has been much greater than their actual market penetration. Metal studs as a substitute for block back-up is subsiding gradually as designers are discovering the shortcomings of that system. But concrete block basements are in a head-to-head struggle with poured concrete.

All these changes will continue through the 1980s, with the biggest problem to be faced by all cement users being the market penetration of lightweight construction by wood, gypsum, metal, and glass. It is in this type of construction where so much of the innovation has taken place and so many code changes favored. As fire ratings for components in the codes are allowed to drift downward, all concrete products suffer market loss. The 4-hour fire rating is becoming as extinct as the drive-in movie. The 2-hour fire rated component is under attack.

These changes in the way buildings are designed and built have more to do with growth than changes in the interest rate. While it may seem that business is exceptionally good, it may be that the demise of so many block plants has left more for the survivors to share. But market penetration and market growth are the real barometers of long term health.

In this respect, the peak of concrete block production was reached in 1973-74, when close to 4 billion units were sold. In 1976-78, average units sold came to 3.6 billion. In 1981 this figure dropped to below 3 billion but has been rising gradually, with 1984 climbing to 3.3 billion. Will the

block industry see another 4 billion unit sale soon? It won't come in 1985, although the signs point to a slight increase above 1984, probably 3.5 billion units at best.

All of this could change quickly if interest rates fall in 1985--something unlikely although they are forecasted to decline somewhat from 1984. With the Republicans controlling the White House and Senate, it is certain that inflation will be kept under control, and therefore the outlook for interest rates is good. But the current wags in Washington wisecrack that if weathermen and economists were interchanged, the predictions would be exactly the same.

So it boils down to what interest rates will be in 1985, and not even the Federal Reserve can manipulate the rates anymore. But while interest rates control how much construction is contracted for, it has nothing to do with the demand for a particular product. It is market share that is the key, and market share is influenced by innovation, by acceptance of innovation in codes, and by relative value in relation to competing products. The erosion of code acceptance favoring lightweight products has been touched upon. Masonry walls still are regarded as a good value, but because they are put in place by highly skilled craftsmen, masonry construction is regarded as "slow," especially when compared to system construction. Lack of masons during periods of high demand increae the perception that masonry construction is slow. This is compounded even further when masons refuse to lift more than 30 lbs. without assistance from another man.

If masonry construction is to remain competitive, this image of slowness has to be remedied while keeping all the virtues of skilled craftsmen construction. It is a challenge to the entire masonry trade for the remainder of the decade. If high productivity can be coupled with skilled craftsmanship, the masonry industry will make a strong comeback in market penetration and therefore, market share. And the concrete block industry can proceed with its pursuit of supplying a high quality, factory manufactured product at the most competitive cost.

Jon Mullarky
Vice President, Promotion
National Ready Mixed Concrete Association

READY MIXED CONCRETE: interest rates the key

Last year was a good year for construction and a very good year for the ready mixed concrete industry in most parts of the country. It was, without a doubt, the best year that concrete producers have seen since 1979 and possibly the best year since production topped 228 million cu. yd. in 1973. Nineteen eighty-four production is estimated to be between 220 and 222 million cu. yd. The value of ready mixed concrete shipments last year topped the $10 billion mark. An active housing market early in the year and strengthening commercial market propelled the industry out of its recession.

What about 1985? The unknown in next year's equation has to be interest rates. Several months ago, when many economists were making their initial 1985 forecasts, interest rates were creeping upward and the outlook for construction, particularly housing, was not very optimistic. At this writing, however, interest rates seem to have peaked and are beginning to fall. If this trend continues, a strengthening housing market in 1985 is not beyond the realm of possibility.

In any event, architects and engineers report a backlog of commercial and institutional construction projects that should give the ready mixed concrete industry a good start in 1985. Most forecasters agree with McGraw-Hill's George Christie that 1985 construction should equal '84's record of $211 billion. If these projections are correct, ready mixed concrete sales should increase slightly in 1985 to something like 224 million cu. yd.

Fromy Rosenberg
Executive Director
Prestressed Concrete Institute

PRESTRESSED: opportunity in the '80s

Early in 1985, the Prestressed Concrete Institute will publish a major work that has been in development for 2 years--"PCI Design Handbook--Precast and Prestressed Concrete." This comprehensive handbook incorporates updated and new technical information from existing PCI publications including the new provisions of the 1983 ACI Building Code as they relate to our products. Through seminars, sponsored by PCI, state associations, and local producer groups, the handbook will be introduced to plant engineers, engineering consultants, and architects.

Strong, vital trade associations are the cornerstone for the consistent growth of any industry. Since its founding in 1954, PCI has been a dominant force behind the remarkable growth and current strong position of precast/prestressed concrete in today's construction market.

Some of the major ongoing programs of the Institute include:

- An eight-project specially funded research and development program. All projects are under contract and are expected to be completed by the end of 1985.
- A stepped-up national advertising program that has included the development of a new advertising series; ads have been, and will be, placed in a number of national trade magazines.
- The initiation of many educational programs, among them seminars for members of the academic community on the state of the art in precast and prestressed concrete.
- Encouragement of the development of new products, new methods of production, or new methods of construction that will benefit the industry through establishment of an Industry Advancement Award.
- The promotion of quality through a plant certification program; the board committee charged with responsibility for the program is continuing its aggressive efforts to enlarge producer member participation.

Backed by a nearly $3 million budget, PCI will continue to serve the needs of the industry in 1985 and beyond. Officers are: President--Michael R. Altenberg, Stanley Structures, Denver, Colo.; vice president--Joseph N. Mallamo, Exposaic Industries, Inc., Charlotte, N.C.,; and secretary/treasurer--Ted J. Gutt, TPAC Division of the Tanner Companies, Phoenix, Ariz.

PRECAST CONCRETE: 1985 looks encouraging

Robert W. Walton
Executive Vice President
National Precast
Concrete Association

At this time in late 1984, the economic environment for 1985 (according to some economists) looks encouraging. Although a recession beginning in 1985 cannot be ruled out, most economists speculate that perhaps this possibility should be given odds of no more than 1 or 2 in 10. Some cite a low inflation rate due to a strong dollar that appears to be able to hold its strength through the end of this decade. Other opinions vary a great deal, with some economists looking at a downturn in 1985--about half. The other half see continued momentum through 1986.

What does this mean to the precast industry? As stated in the past, precast products represented by NPCA's constituency cut across widely diversified lines. We categorize in several major groups, including underground products, transportation products, agricultural products, and a broad list of those products used in the building and housing sector--to mention just a few.

With attention being given to improvement of highways and the infrastructure, those supplying the transportation market should do well. Housing starts are expected to slow in 1985, which will have an impact on many products; although a plus is seen in multi-family housing (investment projects), which is expected to continue strong.

The agricultural sector continues to be a problem for precasters, and we have seen significant diversification in this category to counteract cyclical patterns. Government, power, light, and communication activities will dominate the future of underground products--and we predict 1985 to be a good year for such producers.

In conclusion, given a reasonable continuance of the 21 months of cyclical recovery, we expect the precast industry to expand at a modest rate. Increased production coupled with cost reductions should "auger well" for profit improvement in 1985.

CONCRETE PIPE: congressional action important

Richard E. Barnes
President
American Concrete
Pipe Association

The federal deficit and the uncertain direction of interest rates will continue to affect long-term construction growth, but 1985 sales of concrete pipe should closely match the increased volume during 1984. Public works projects, including highway and bridge construction, sewage systems, and water resource projects, have all been predicted to increase during 1985, but at a slower rate than total construction activity. However, directly impacting upon the sales of the concrete pipe industry is the action, or lack of action, within the U.S. Congress.

On October 12, 1984 the second session of the 98th Congress adjourned without taking any action on construction legislative issues of direct interest to our industry. The major items that did not receive action, and therefore must be introduced in the next Congress, include highway legislation and approval of the Interstate Cost Estimate (ICE), reauthorization of the Environmental Protection Agency's construction grants program funding, and a water resources funding bill for Corps of Engineers and Bureau of Reclamation projects. The only action taken was appropriation of $2.4 billion in FY 1985 for clean water, which resulted in the Congress delaying allocation of $41.6 billion in these three areas.

Without major highway legislation, and approval of ICE, Congress deleted about $7 billion from the highway construction industry this year and into 1985. Some observers of the Washington scene expected Congress to pass a major highway bill during this election year, with all the added-on demonstration projects, but most of us were hopeful we might have obtained an extension of what was called a "clean" ICE for 18, 12, or 6 months.

Everyone interested in the clean water programs of the EPA were disappointed that only $2.4 billion was allocated for FY 1985 for the construction of wastewater treatment plants and interceptor and outfall pipelines. Had Congress passed S.431 or H.R.3282, this program, through fiscal year 1988, could have received $16.6 billion in funding. With the action delayed until the next Congress, this amount could shrink to $9.2 billion because the Senate has expressed its opposition to increasing the current level of funding for this program. The Administration also supported the current $2.4 billion level of funding in a draft of their 1-year review of the program.

For many years ACPA surveyed the concrete pipe industry to determine total sales in the U.S. and Canada, and those data enabled our maintaining an accurate record of trends within the industry. The significant decline in industry sales from 1981 through early 1983 required curtailment of a number of association programs and, unfortunately, the statistical data survey was one of the casualties.

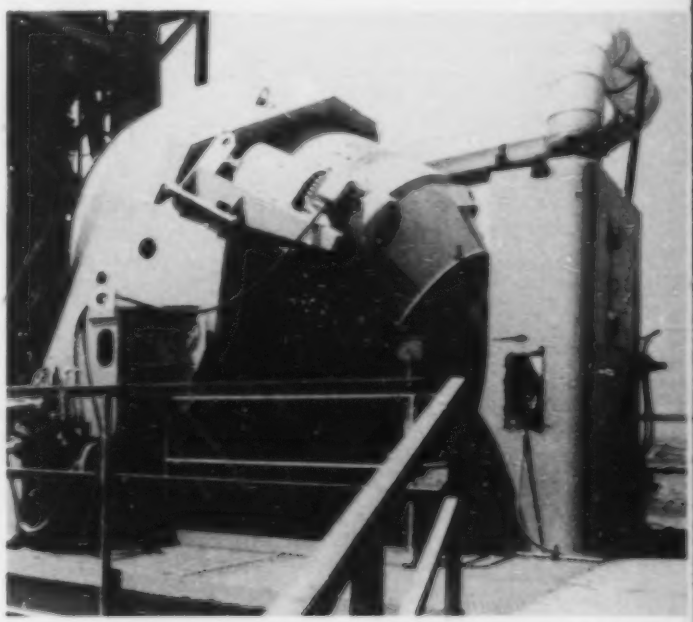
We do not have data to accurately forecast the increase in sales of concrete pipe and related products over the past 18 months, but the turnaround has been significant.

Industry sales have increased dramatically, and there is an attitude of optimism throughout the industry. Markets are strong, backlogs are impressive, at least through the first half of 1985, and major problems at this time appear to be the immediate availability of raw materials, such as welded wire fabric, and the fact that prices still are depressed.

ACPA members, recognizing the slow growth characteristics of the pipe industry, have begun to intensify efforts to penetrate existing markets. Over $2 million has been invested in the development of the SPIDA (Soil Pipe Interaction Design and Analysis) computer program now being accessed and tested by member companies, which will provide more economical in-place designs of concrete pipe, and efforts are planned during the coming year to introduce this new tool to the engineering profession. During the past year the association sponsored and published the "Design Manual for Sulfide Corrosion Prediction and Control," which provides members and engineers with procedures and design aids for predicting and controlling hydrogen sulfide generation and corrosion in sanitary sewer systems. This should result in not only resisting claims made by some competitive pipe producers, but will lead to the specification and use of concrete pipe on projects where it may not have been previously permitted.

Ready mixed concrete

Production volumes rise for 2nd year



By Patricia Murphy

The trucks are rolling in the ready-mix industry as respondents to our annual survey report production volumes that, nationwide, top those of 1983 by 25.9%. All regions but one--the West North Central states where volume decreased by 3.8%--reported production increases that ranged from 1.4% in the West South Central states to 55.6% in the South Atlantic states. Of the respondents to the survey, 64.9% sold more cu. yds. of concrete in 1984 than in 1983, 20.7% sold less, and 14.2% maintained 1983 levels of production.

Summary 1984 Concrete Ready-Mix Survey

Review of 1984	
Production (as reported in cu. yds.)	
1984 vs. 1983	
Up (% of replies)	64.9%
Down (% of replies)	20.7%
Same as '83 (% of replies)	14.2%
Overall volume change	+25.9%
Regional volumes	
New England	+36.8%
Middle Atlantic	+15.4%
East North Central	+17.2%
West North Central	− 3.8%
South Atlantic	+55.6%
East South Central	+14.8%
West South Central	+ 1.4%
Mountain & Pacific	+ 3.8%
Prices	
% raising prices in '84	50.3%
% increase (weighted average)	6.2%
% decreasing prices in '84	13.9%
% decrease (weighted average)	6.5%
% kept prices at '83 levels	35.8%
Costs	
• Wages	
% paying increase in '84	71.6%
% increase (weighted average)	6.9%
• Raw materials	
% paying increase in '84	74.1%
% increase (weighted average)	7.1%
• Fuel/Engery	
% paying increase in '84	46.8%
% increase (weighted average)	7.3%
• Transportation	
% paying increase in '84	61.8%
% increase (weighted average)	6.8%
• Maintenance	
% paying increase in '84	63.4%
% increase (weighted average)	11.1%
• Promotion	
% spending less than 1% of sales $	53.9%
average spent by all respondents	2.2%
Outlook for 1985	
Business expectations	
% expecting an increase	38.3%
% increase expected	13.0%
% expecting decline	13.2%
% decline expected	11.4%
% expecting no change from '84	48.5%
Plans for 1985	
% planning expenditures	67.9%
Of that number:	
% planning new plants	18.3%
% planning modernization and/or expansion	51.0%
% planning equipment purchases	67.3%
(Total exceeds 100% because of multiple responses.)	

Ending the second year of a sometime stumbling and uneven recovery, ready-mix producers appear optimistic, but restrained, about 1985. Slightly more than 38% anticipate more business this year, 13.2% expect less, and 48.5% are looking to stay at 1984 levels.

Interest rates, the availability of mortgage money, and a steady rather than spectacular economic growth rate were the interlocking factors cited by producers as those that would have the greatest effect on their business in the new year. As in past years, the industry calls attention to the need for balanced growth--not peaks and valleys--in the economy.

Price changes

Regarding pricing in 1984, the respondents were split 50-50 between those who raised prices and those who either lowered the cost of a cu. yd. of concrete or maintained 1983 rates. Slightly more than 50% raised prices a weighted average of 6.2%; 13.9% lowered prices a weighted average of 6.5% while 35.8% charged the same in 1984 as they had in 1983.

Costs

The cost of doing business was higher in 1984 for more than half the respondents in all categories but fuel/energy; in the latter case, less than half (46.8%) experienced increased costs of about 7%. At the same time, in only two categories--wages and raw materials--were costs higher for close to three-quarters of the respondents; anywhere from 25% to 40% of those answering were able to lower costs or at least hold the line in 1984.

For example, slightly more than 63% had higher maintenance costs to contend with in 1984; 30.4% experienced costs no higher than those of 1983, and 6.1% managed to lower this factor. Maintenance of trucks represented the biggest headache for the most respondents; others cited a dearth of experienced diesel mechanics, trouble obtaining parts, and the inability to find (and keep) good general mechanics.

As in past years, monies spent for advertising/marketing/promotion still represent a very small proportion of respondents' expenses. More than half spend less than 1% of the sales dollar, and the average for all respondents is 2.2%.

Outlook for 1985

As mentioned earlier, ready-mix producers are restrained about the new year. Business certainly was better in 1984, but there is a "wait and see" attitude about 1985 that comes through the comments of the producers. The nation's general economic health, as measured by interest rates and the strength of other basic industries such as steel, auto, and coal, appears uppermost in the minds of most respondents.

"If this country can get started on a steady growth march and get off the roller coaster we've been on for 20 years, there might be some hope," said one Midwest producer. Another commented about price wars: "Someway, somehow, we as a group must stand together and relate to one another the importance of making a decent ROI and that cutting prices to increase volume benefits no one."

Regarding expenditure plans for the new year, an encouraging 87.9% answered that they expected to invest in either new plants, modernization, and/or new equipment. Of that number, most are looking at equipment purchases and modernization or expansion of existing facilities; 18.3% reported plans for new plants. All plans hinge on the pervasive "ifs" and how they will be answered in the year ahead. ●

Masonry production up again in 1984

By Patricia Murphy

For the second consecutive year, masonry producers, answering *Concrete's* annual industry survey, reported production volumes that represent increases over the levels of the previous 12 months. Nationwide volume, as reported in the number of 8-in. equivalents produced, rose 22.4% compared to 1983 totals. More than 70% of the responding producers reported total production was higher in 1984 than in 1983; 7.6% reported lower volumes while slightly more than 13% maintained 1983 levels of production.

Compared to last year, the percentages reporting an increase in production or maintenance of the previous year's levels are about the same, but the percentage reporting a decline (7.6) cuts the comparable 1983 figure by more than half; in 1983, 18.2% of the respondents reported a decrease in volume.

Looking ahead to 1985, producers are about evenly divided between anticipation of a better year (46.3%) and of one that represents no change from 1984 (47.6%). Last year, more of the respondents (65.8%) were willing to predict improved production volumes--an optimism that was rewarded.

Slightly more than 70% of those answering the 1984 survey produce both lightweight and standard weight units (the remaining 29% produce either all lightweight or all standard weight). Of those offering a mix, 40% did not change their ratios of lightweight to standard weight; 33.8% increased the number of lightweight units compared to their 1983 production, while 26.1% decreased the ratio of lightweight to standard weight.

The 1984 price picture is a turnaround from that of the previous year--in 1983, about 60% of the respondents did not raise their prices; in 1984, 67.1% of those answering raised prices a weighted average of 6.2%. Nearly 30% held prices to 1983 levels while 3.5% of the respondents decreased their prices a weighted average of 4%.

Costs

The overall cost of doing business--wages, raw materials, fuel/energy, transportation, and maintenance--rose about the same percentage in 1984 as it did in 1983. Producers answering the 1984 survey reported cost increases of 8.1% (weighted average); last year, that average was 8.7%.

An accompanying table shows that the rates of cost increases were not much different for the 1984 re-

Increases in Cost of Doing Business

	1984 Respondents		1983 Respondents	
	% reporting increase	av. increase	% reporting increase	av. increase
Wages	86.9%	6.6%	63.4%	6.2%
Materials	84.7%	7.8%	80.0%	6.9%
F/E	57.6%	8.6%	75.4%	11.6%
Trans.	77.1%	8.8%	70.4%	8.9%
Maint.	70.2%	9.6%	81.1%	9.9%

Summary 1984 Concrete Masonry Survey

Review of 1984

Production (as reported in 8-in. equivalents)

1984 vs. 1983	
Up (% of replies)	70.3%
Down (% of replies)	7.6%
Same as '83 (% of replies)	13.1%
No response	8.7%
Overall volume change	+22.4%

Lightweight vs. standard weight units

% reporting a mix	71.4%
Of that number, % increasing 1.w.'s share of mix	33.8%
% decreasing 1.w.'s share of mix	26.1%
same ratio—1.w. to st.w.	40.0%

Prices

% raising prices in '84	67.1%
% increase (weighted average)	6.2%
% decreasing prices in '84	3.5%
% decrease (weighted average)	4.0%
% kept prices at '83 levels	29.4%

Costs

$ Wages	
% paying increase in '84	86.9%
% increase (weighted average)	6.6%
$ Raw materials	
% paying increase in '84	84.7%
% increase (weighted average)	7.8%
$ Fuel/Energy	
% paying increase in '84	57.6%
% increase (weighted average)	8.6%
$ Transportation	
% paying increase in '84	77.1%
% increase (weighted average)	8.8%
$ Maintenance	
% paying increase in '84	70.2%
% increase (weighted average)	9.6%
$ Promotion	
% spending less than 1% of sales $	49.3%
% spending 1-5% of sales $	31.6%
% spending 5-10% of sales $	19.1%

Outlook for 1985

Business expectations

% expecting an increase	46.3%
% increase expected (weighted av.)	14.6%
% expecting decline	6.1%
% decline expected (weighted av.)	11.0%
% expecting no change from '84	47.6%

Plans for 1985

% planning expenditures	62.6%
Of that number:	
% planning new plants	10.5%
% planning modernization and/or expansion	61.4%
% planning equipment purchases	61.4%

(Total exceeds 100% because of multiple responses.)

spondents than for those who answered in 1983--except in fuel/energy costs where the rate of increase was 3% lower than last year and the number reporting any increase in this category dropped, compared to 1983, nearly 20%. Also, the number reporting an increase in maintenance costs was about 11% less than the comparable number of 1983. Wage increases rose at about the same rate, compared to 1983, but the number reporting such increases rose 23.5% in 1984.

Outlook for 1985

An increased awareness of the need for promotion was evident from the comments of respondents to the 1984 survey. As one Midwest producer remarked, "If masonry could put a sales program into effect vis-a-vis designers as have the steel stud promoters, we, rather than the steel companies, would have the biggest share of the market." Lack of promotion by individual producers was evident in the survey responses--nearly half spend less than 1% of the sales dollar on advertising/marketing/promotion; of the other half, slightly more than 30% spend between 1% and 5%, and the remainder (19.1%) spend between 5% and 10%. At the same time, compared to other years, there were far more comments about promotion and marketing as important factors in increasing business and recognition that other building materials are the real competition for masonry producers. In the words of a Michigan producer: "If we will stop competing against ourselves and start competing against wood, glass, and steel, business will improve."

Interest rates and the health of the construction industry top the list of factors producers believe will affect business next year. As mentioned earlier, 46.3% look forward to a better year in 1985 while 47.6% expect a year similar to 1984. Those looking for an increase in production expect it to go up by 14.6% (weighted average). Slightly more than 6% of those responding to the survey anticipate a decline in production of 11% (weighted average).

More than 60% of those responding to the 1984 survey (62.6%) are planning to invest in either new plants, modernization and/or expansion of existing facilities, or new equipment; that's a healthy 12% jump from the percentage of expenditure-minded respondents to the 1983 survey. Of the 1984 group, 61.4% are anticipating expenditures for modernization or equipment; only 10.5% are looking at plans for new plants. As in past years, plans are contingent on the economic outlook for 1985. ●

Precast concrete

1984 production up 21%; 1985 expected to be another good year

By Eric Schroder

Precast concrete production increased 21% in 1984, following an 11.5% rise in 1983. And precast producers, responding to *Concrete's* year-end survey, predicted even further increases in 1985.

Sixty-two percent of survey respondents indicated production gains, 8% reported decreases, and 29% said they had no change in production rates. The Mountain region led the parade with a 46% rise in production, followed by the Pacific area with a 35.5% jump. Only the East South Central region reported a decline in production, at 19.5%. Other regional figures, all increases: South Atlantic, 27%; East North Central, 26%; West South Central, 26%; New England, 18%; Middle Atlantic, 14%; and West North Central, 4%.

Residential products led the way in percentage of concrete used for

specific purposes at 23.3; next was general construction, 16.5%, and architecture, 15.5%. The largest category was "other," which included burial vaults, sewer and septic tanks, etc.

The total percentage of change in 1984 prices was +3.9; 59% of respondents raised prices an average of 6.6%, about the same average rise in 1983. Less than 1% lowered prices in 1984. Meanwhile, wages were increased an average of 6.6% by more than 77% of respondents. Less than 2% reduced wage costs, at an average of 11%; this is reflected in the overall percentage change for wages in 1984, +5.

Cost factors affecting producers' bottom lines all increased last year, on the average. Maintenance costs, up 7.5% overall, were reported increased by 58.6% of respondents at a 13.3% clip; producers claiming decreases averaged a 35% savings but only 2.8% reported a decline. Raw material costs, up 6.5% overall, were reported increased by 76% at an 8.6% rate. Less than 5% of respondents said raw material costs decreased, at an average of 7.5%

Fuel and energy costs increased by a total percentage of 6.6, reflecting the 59% who said their average increase was 11.2% and the 9% who claimed energy cost decreases averaging almost 12%. Overall, transportation costs rose 5.5%; 60.5% of respondents reported an average increase of 9.1%, while 3.8% said their costs decreased at an average rate of 8.2%.

The year's biggest maintenance problem was trucks, again, with nearly 60% of respondents finger-pointing in that direction. Loading equipment was a maintenance problem for 21%; 11% replied that updating equipment and preventive maintenance was costly; and nearly 9% of the producers complained of a lack of good mechanics.

Precasters spent an average of 3.2% of every sales dollar for promotion, marketing, and advertising in 1984. Twenty-six percent spent between .51 and 1%; 23% spent 2% of their sales dollar; and 10% said they spent 5%.

Eighty-seven percent of respondents named factors affecting future business. Nearly 50% cited interest rates and the "cost of money" as critical; 11% are hoping for increased home building and other construction; 11% said factors are a stable economy and low inflation; outside competition is a concern of 10%; and another 10% claim the costs of raw materials, energy, etc., will affect their operations.

Outlook: Overall, precast producers expect production to increase 11.4% in 1985. Nearly 70% expect increases averaging 16.6%, while 8.7% look for decreases on the average of 12.5%; 22.3% expect no change in their business volume.

Sixty-five percent of respondents plan to effect some change in their operations this year. New equipment purchases are planned by 71%, at an average expenditure of $67,250. Forty-eight percent will expand existing facilities and spend an average of $176,200. New plants, in the blueprints for 11%, will cost an estimated average of $988,125 in 1985.

Survey comments: From Florida: "Availability and price of wood is hurting concrete industry in Florida." From Illinois: "We must get legislators convinced industrial mid-America still is sick economically." From Missouri: "General public needs to be better educated about concrete; people's perception of concrete is lagging far behind today's applications and versatility." And from Maine: "I feel the future is unlimited." ●

Summary
Concrete Magazine's Precast Concrete Survey

Review of 1984	
Industry output 1983 vs. 1984	+21%
Pricing of products	
prices raised (% replies)	59%
% of increase	6.6%
Costs	
• Wages	
increased (% replies)	77.3%
% of increase	6.6%
• Maintenance	
increased (% replies)	58.6%
% of increase	13.3%
• Raw Materials	
increased (% replies)	76.4%
% of increase	8.6%
• Energy/Fuel	
increased (% replies)	59.4%
% of increase	11.2%
• Transportation	
increased (% replies)	60.5%
% of increase	9.1%
Outlook for 1985	
Production gain (% replies)	68.9%
% of gain	16.6%
Production drop (% replies)	8.7%
% of drop	12.5%
No change (% replies)	22.3%
Total % change	+11.4%
Plans for 1985	
% planning expenditures	65.7%
New plants (% replies)	11%
New equipment	71%
Plant expansion	48%

Prestressed concrete

Prestressers see huge production gain; 1985 looks promising

By Eric Schroder

Prestressed concrete producers enjoyed a boom in business in 1984 with an overall reported production increase of 32%. *Concrete's* year-end survey revealed 70% of respondents increased production while only 14% experienced declines. Thirty-four percent reported no change in their business volume. In 1983, prestressers told *Concrete*

their production decreased 2%.

Regionally, the West North Central rose 37.7%, followed by the Pacific and Mountain regions with 32% each. The East South Central region showed the lowest increase, .02%. Other regional figures: East North Central, 31.3%; West South Central, 31%; South Atlantic, 29%; Middle Atlantic, 18.8%; and New England, 12.5%.

The total percentage of change in 1984 prices was +2.5; 35% of responding producers raised prices an average of 7.2%, and 18.6% reduced prices an average of 6.7%. Meanwhile, wages were increased by 84% of respondents at an average of 5.3%. Total percentage of change was +4.4, reflecting those producers who did not increase wage costs. No survey respondent indicated a drop in wage costs.

Factors affecting producers' bottom lines all reflected total percentage increases. Maintenance costs, up 4.9% overall, were reported increased by 57% of respondents at an average 9% clip. Producers claiming maintenance cost decreases (9.5%) averaged a drop of 12.6%. Raw material costs, up 4.6% overall, were reported increased by 76% of respondents at an average of 6%. No producer reported a decrease in raw material costs.

Fuel and energy costs increased by a total percentage of 4.8, reflecting the 50% who said their average increase was 9.8% and the 20.5% who claimed energy costs had decreased an average of 12.5%. Overall, transportation expenses increased nearly 4%. Fifty-five percent of respondents averaged raises of 7%, while 4.7% experienced drops averaging 2%.

Nearly half of survey respondents cited trucks as being a maintenance headache. The age of equipment and the cost of updating it is a maintenance problem for 20%; another 20% named loading equipment as being troublesome; 14% had problems with pumps and pipes; and 11% cited mixers, drive trains, and drive lines as being maintenance puzzles.

Producers averaged spending 2.3% of each sales dollar in 1984 on promotion, marketing, and advertising. Thirty-one percent spent between .51 and 1% of each dollar but nearly 15% spent less than one-half a percent.

Interest rates and the "cost of money" were cited by 59% of respondents as being factors affecting future business. Another 25% named a stabilized economy and low inflation as important. Twelve percent look for increased bridge, highway, and road construction, and increased government spending. The cost of raw materials, energy, etc., was a factor named by 10% of respondents.

Outlook: More than 58% of respondents believe production will increase in 1985, at an average gain of 14.2%; 4.7% said business volume will decrease an average of 8.5%. Thirty-seven percent expect no change in volume. Overall, the total percentage of change is expected to be +8.

In planning for 1985, 80% of respondents said they would effect some change in operations. Plant expansions are in the works for 57.5%, with estimated costs averaging $667,631. Another 54.5% plan to buy new equipment and spend an average of $285,000. Nine percent expect to build new plants at an average cost of $606,666.

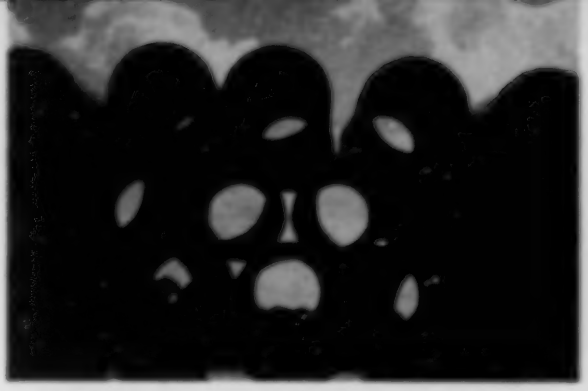
Survey comments: From Arkansas: "Public must be educated as to 'life' of concrete products vs. cheaper building materials." From West Virginia: "Unions are killing us." Then from North Dakota: "We have to become more efficient and produce top quality to obtain larger market shares." And from Florida: "We must gain continuing recognition of the quality, durability, and flexibility of prestressed concrete products." ●

Summary
Concrete Magazine's
Prestressed Concrete Survey

Review of 1984	
Industry output 1983 vs. 1984	+32%
Pricing of products	
prices raised (% replies)	34.9%
% of increase	7.2%
Costs	
• Wages	
increased (% replies)	84%
% of increase	5.3%
• Maintenance	
increased (% replies)	57%
% of increase	9%
• Raw Materials	
increased (% replies)	76.7%
% of increase	6%
• Energy/Fuel	
increased (% replies)	50%
% of increase	9.7%
• Transportation	
increased (% replies)	55.8%
% of increase	7%
Outlook for 1985	
Production gain (% replies)	58.1%
% of gain	14.2%
Production drop (% replies)	4.7%
% of drop	8.5%
No change (% replies)	37.2%
Total % change	+8%
Plans for 1985	
% planning expenditures	80%
New plants (% replies)	9%
New equipment	54.5%
Plant expansion	57.5%

Concrete pipe

1984 sees 20% production growth; majority expects continued upswing



By Eric Schroder

Concrete pipe production increased 20% in 1984, and every region of the country reported gains, ranging from 12 to 35%. This was the second straight year production increased following a 3-year decline. And, exactly half of the respondents of *Concrete's* year-end survey predicted no change in their production figures for 1985.

The 20% production increase figure breaks down as follows: 65% reported increases, 10% decreases, and the remaining 25% had no change in production. The Pacific region led the gains with 35% growth; the West South Central area followed with 32%. At twelve percent, the Mountain region showed the least production increase. Other regional increases: East South Central, 26%; South Atlantic, 22%; East North Central, 20%; Middle Atlantic, 16%; and West North Central, 16%.

The total percentage of change in 1984 prices was +3.5%; nearly 40% of responding producers raised prices an average of almost 9%, and about 15% reduced prices more than 10%. Wages, on the other hand, were increased by 76% of the respondents at an average rise of 5.8%. Total percentage of change was +4%, reflecting the 8% of producers who cut wage costs by an average of nearly 18%.

Factors affecting producers' ability to survive economic fluctuations all reflected total percentage change increases. Maintenance costs, up 5.3% overall, were reported increased by 63% of the respondents at an 8.5% clip. Producers claiming maintenance cost decreases averaged an 11.6% savings. Raw material costs, up 4.6% overall, were reported increased by 77% of the respondents at an average of 6%.

Fuel and energy costs increased by a total percentage of 5.6, reflecting the 58% who said their average increase was 10.2% and the 6% who claimed energy cost decreases averaging more than 19%. Overall, transportation expenses increased 5%. Sixty-one percent of the respondents averaged raises of 8.5%, while 6% experienced drops averaging 12.5%.

Loading equipment, including cranes, forklifts, and jacks, was the biggest maintenance headache for producers in 1984, according to the survey. Thirty percent named that problem, followed by 27% who said trucks were trouble; 18% cited the cost of newer equipment as a "maintenance" problem. Electrical and electronic equipment repairs were a hassle for 12% of the respondents.

Producers estimated 1984 percent of sales dollar spent for promotion, advertising, or marketing as 2.5%; 29% spent between .51 and 1%, while one quarter of the respondents spent less than .25%.

Eighty-two percent of respondents named factors affecting future business. More than 35% cited interest rates and the "cost of money" as critical; another 24% look for increased highway, bridge, and road construction. Other factors specified frequently were population growth (particularly in the Sunbelt), government spending, and sewage treatment plant expansions.

Outlook: Exactly half of survey respondents expect production in 1985 to match that of 1984. Thirty-seven percent expect production gains averaging 11%; 13% of the producers anticipate production drops averaging 12%. These figures reflect an overall percentage change of +4% for 1985.

Sixty-five percent of respondents expect to effect some change in operations this year. Plant expansions are in the blueprints for 32%, at an average cost of $267,000; 43% plan new equipment expenditures, averaging $370,000; and 4% hope to build new plants, costing a projected average of $1.9 million.

Survey comments: From Washington: "Improved technology and young people needed in our industry." From Indiana: "Too many producers are order-takers; they do nothing to market the product." From Kentucky: "With metal pipe's political clout and the advent of plastic pipe, RC pipe is a thing of the past!" And from South Dakota: "RCP industry has reached its plateau." ●

Summary
Concrete Magazine's
Concrete Pipe Survey

Review of 1984	
Industry output	
1983 vs. 1984	+20%
Pricing of products	
prices raised (% replies)	39.5%
% of increase	8.9%
Costs	
• Wages	
increased (% replies)	76%
% of increase	5.8%
• Maintenance	
increased (% replies)	63%
% of increase	8.5%
• Raw Materials	
increased (% replies)	77.5%
% of increase	6%
• Energy/Fuel	
increased (% replies)	58%
% of increase	10.2%
• Transportation	
increased (% replies)	61%
% of increase	8.5%
Outlook for 1985	
Production gain (% replies)	37%
% of gain	11%
Production drop (% replies)	13%
% of drop	12%
No change (% replies)	50%
Total % change	+4%
Plans for 1985	
% planning expenditures	65%
New plants (% replies)	4%
New equipment	43%
Plant expansion	32%

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Getting it through the primary—an early element in material handling

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Comparison of 1984/1983 Construction Contract Values*

	11 Mos. 1984 (000,000)	11 Mos. 1983 (000,000)	Cumulative Percent Change
Nonresidential building	$ 67,781.3	$ 57,514.7	+18
Residential building	95,110.1	86,982.3	+ 9
Nonbuilding construction	33,198.2	35,532.2	− 7
Total construction	$196,089.6	$180,029.2	+ 9

Dodge Index
(1977 = 100, Seasonally Adjusted)

September 1984 .... 144 October 1984 .... 146 November 1984 158

**Based on statistics compiled by F.W. Dodge Div., McGraw-Hill Information Systems*

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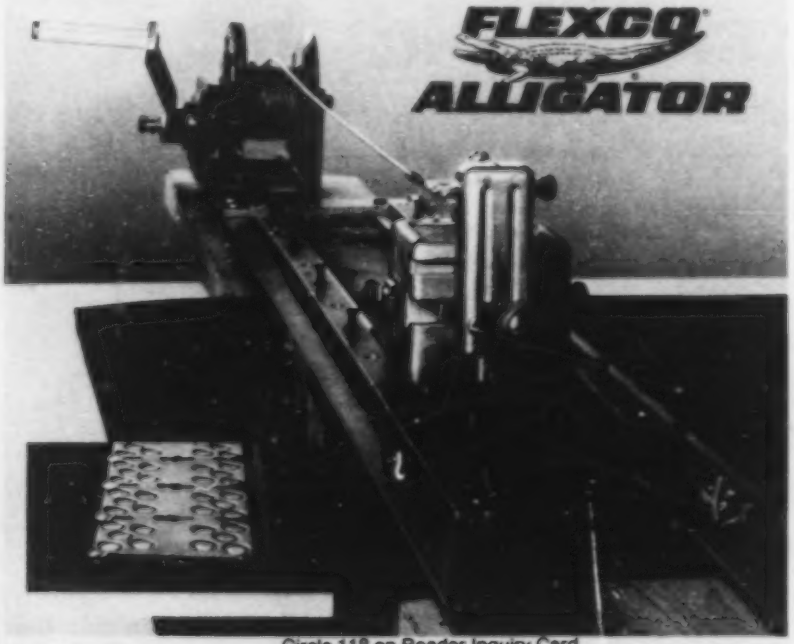

Circle 118 on Reader Inquiry Card

Point, Md. The terminal's 675-ton storage silo is located on a 5-acre site serviced by the Seaboard/Chessie Railroad system.

Southwestern Portland will expand Odessa, Tex. plant

Southwestern Portland Cement Co. is expanding its Odessa, Tex., plant. Start-up of the new equipment is scheduled for May 1985.

Major equipment, supplied by Fuller Company, includes a 3,000-hp cement mill system incorporating an O-SEPA air separator and a two-compartment 12 ft., 6 in. x 39-ft. ball mill. Other equipment includes dust collectors for the finish mill, Airslide conveyors, a clinker bin, slide gates, weigh belt feeders, bucket elevators, and flowmeters.

The Odessa plant operates two dry process lines. An 800-stpd long dry kiln line was installed in 1958 and a 900-stpd preheater kiln system was added in 1975.

ASTM publishes technical book on gypsum

Analytical methods and problems with synthetic gypsum are presented in an ASTM special technical publication, *The Chemistry and Technology of Gypsum.* The book is the result of an ASTM symposium that featured discussions of theories, test methods, analysis, and basic information on gypsum and its products.

The book is available through ASTM Customer Service, 1916 Race St., Philadelphia, Pa. 19103. Cost is $23.20 for members and $29 for nonmembers.

IBAU Hamburg marketing rights procured by Fuller

Fuller Company has agreed to exclusive North American marketing rights of IBAU Hamburg's cement silo and blending design technology. IBAU, formed in 1975, has designed and delivered more than 400 storage and blending silos worldwide.

The silo system incorporates an internal central cone; the silo design stores cement, raw meal, fly ash, lime, and other bulk powder products, and can be used as an energy efficient blender as well, according

(Continued on page 14)

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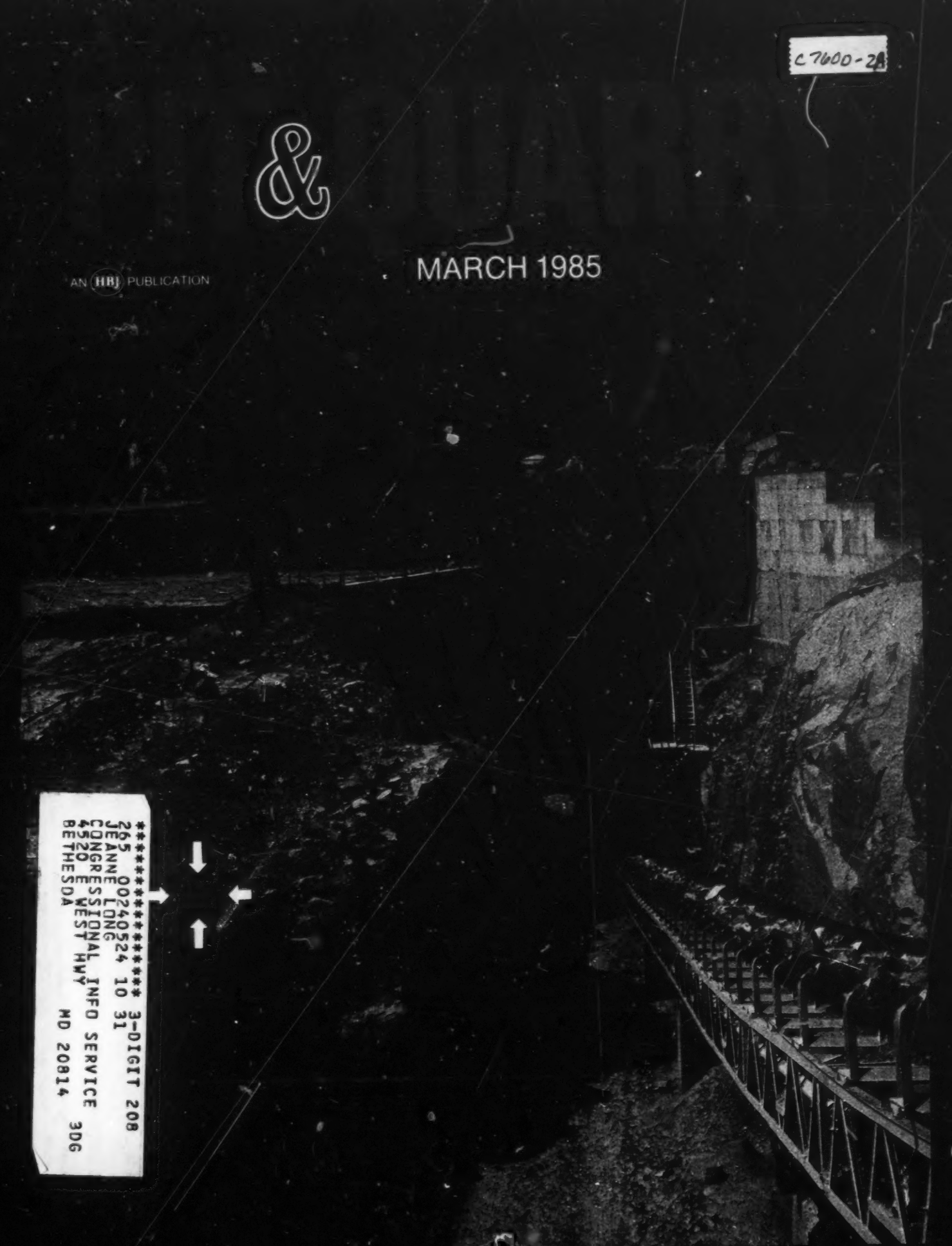
MARCH 1985

AN HBJ PUBLICATION



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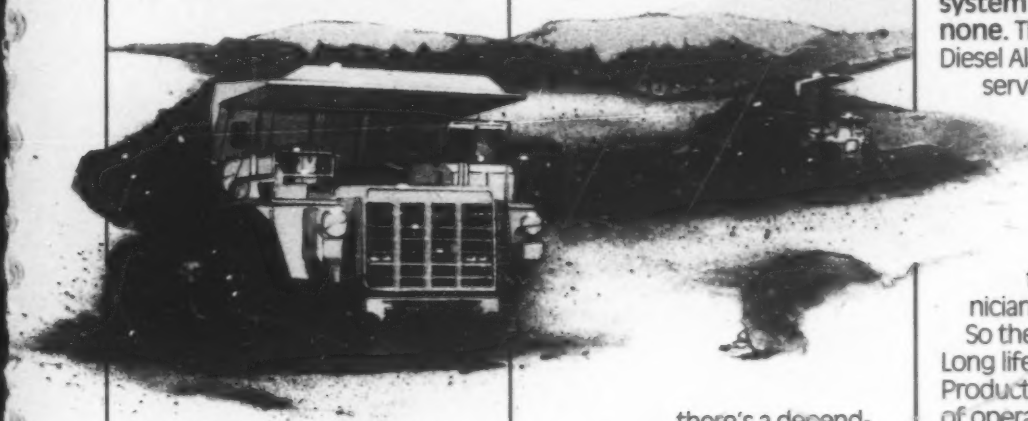
THE AUTOMATIC DECISION:

Where to find the right transmission for haul trucks.

There's nothing small about the job you do. Off-highway hauling demands the biggest, toughest trucks around. Trucks that have to perform. And perform efficiently.

So when it comes time to buy new haulers, you have a big decision to make. Shouldn't you make sure the hauler you spec comes with an Allison Automatic or Powershift transmission?

We think that's one decision that should be easy to make—especially once you consider the facts.



fact: Allison transmissions are engineered for long life and low downtime. Allison hydraulically-actuated, self-adjusting gear clutches provide a smooth transfer of power to the wheels for less drivetrain stress. Result: low downtime. Plus, Allison transmissions help improve productivity with quick response, ease-of-operation and good fuel economy.

fact: Allison transmissions are No. 1 with OEMs. No matter what the application, there's a dependable Allison to handle the job—in a horsepower range of 70 to 1840 (52 to 1373kW). Plus, Allison hauling transmissions come with innovative electronic controls for even smoother shifts, and an optional output retarder for increased vehicle control. Good reasons why Allison continues to be the transmission chosen by over 200 OEMs who produce more than 1500 different pieces of equipment. You see, those equipment manufacturers who have a choice choose Allison.

fact: Go with an Allison transmission and you go with a leader. The first Allison hauling transmission went to work in 1948. Now, well over a million transmissions later, Allison is still the number one name in automatic and powershift transmissions. Allison quality and dependability are known and respected throughout the world.

fact: Each Allison transmission comes with a support system that's second to none. That's because Detroit Diesel Allison has a sales and service network of almost 5000 distributors and dealers worldwide. That includes complete parts availability and fully trained service technicians—all to serve you.

So there you have it. Long life and low downtime. Productivity-improving ease of operation. Economical performance. And worldwide sales and service support from an industry leader. With facts like these, the decision is so simple...it's automatic.

Tough, dependable Allison transmissions.

For more information, contact your local equipment dealer or Detroit Diesel Allison distributor, or write Detroit Diesel Allison, Division of General Motors, P.O. Box 3338, Livonia, Michigan 48151-3338.

The Allison Automatics

SERVING YOU—AROUND THE WORLD.

Detroit Diesel Allison

Circle No. 118 on Reader Inquiry Card

Comparison of 1984/1983 Construction Contract Values*

	12 Mos. 1984 (000,000)	12 Mos. 1983 (000,000)	Cumulative Percent Change
Nonresidential building	$ 73,225.7	$ 62,284.2	+18
Residential building	100,762.6	93,566.6	+ 8
Nonbuilding construction	35,872.5	37,751.8	− 5
Total construction	$209,860.8	$193,602.6	+ 8

Dodge Index
(1977 = 100, Seasonally Adjusted)

October 1984 .... 146 November 1984 .... 158 December 1984 148

**Based on statistics compiled by F.W. Dodge Div., McGraw-Hill Information Systems*

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Circle No. 109 on Reader Inquiry Card

Coming Events

NATIONAL ASSOCIATIONS

MARCH 11-15
Plant Operators' Committee Meeting
National Slag Association
Baltimore Hyatt Regency
Baltimore, Md.
Contact: R.K. Eggleston
NSA
300 S. Washington St.
Alexandria, Va. 22314

MARCH 17-20
National Sand and Gravel Association
Operator's Meeting
L.A. Airport Hilton
Los Angeles, Calif.
Contact: Richard C. Meininger
NSGA
900 Spring St.
Silver Spring, Md. 20910

MARCH 18-20
"Sales Training II"
NRMCA/NSGA/PCA
PCA Cement and Concrete Center
Skokie, Ill.
Contact: PCA
5420 Old Orchard Rd.
Skokie, Ill. 60077

MAY 20-23
77th NSFE Concrete Industry Technical Conference
Hyatt Regency
New Orleans, La.
Contact: Wayne Mitchell
P.O. Box 3
Houston, Tx. 77001

JUNE 24-28
International Mining Exhibition
Association of British Mining Equipment Companies
National Exhibition Centre
Birmingham, England
Contact: Richard West
Mining Industry Promotions Ltd.
PO Box 53, Rickmansworth
Hertfordshire WD3 2AG
England

JUNE 25-28
20th U.S. Symposium on Rock Mechanics
South Dakota School of Mines and Technology
Rapid City, S.D.
Contact: Prof. Eileen Ashworth
Mining Engineering Dept.
SDSMT
Rapid City, S.D. 57701-3995

Accident prevention—where to start?

For best results, where should we spend our safety dollars? This is a common question often asked by quarry management. The Liberty Mutual Insurance loss prevention group thought they might provide a helpful answer by analyzing high cost workers' compensation accidents reported by their policy holders. The analysis identified frequency and cost levels in various accident categories as shown in the accompanying chart.

It would appear that the control of four accident sources are of about equal importance to quarry management in order to prevent the recurrence of future serious accidents. The four categories shown are very general: vehicles, falls, conveyors and crushers, and manual material handling. When reviewed with knowledge of a particular quarry operation, controls directed at these most expected areas should become evident and, therefore, tend to be most cost effective.

In reviewing these problem areas, management might consider the following questions about their own operation:

Vehicles--

- Are there standards for driver selection?
- Is there an effective driver training program?
- Is there a planned traffic pattern established throughout the quarry?
- Are all vehicles covered by a preventive maintenance program?

Falls--

- Are employees instructed in safe use of ladders?
- Is equipment access considered at time of purchase and in maintenance programs?
- Does plant preventive maintenance program include walkways and railings?
- Are maintenance employees requested to tie off when exposed to a fall hazard?
- Is there an effective means for employees to have tripping and falling hazards eliminated?

Conveyors and crushers--

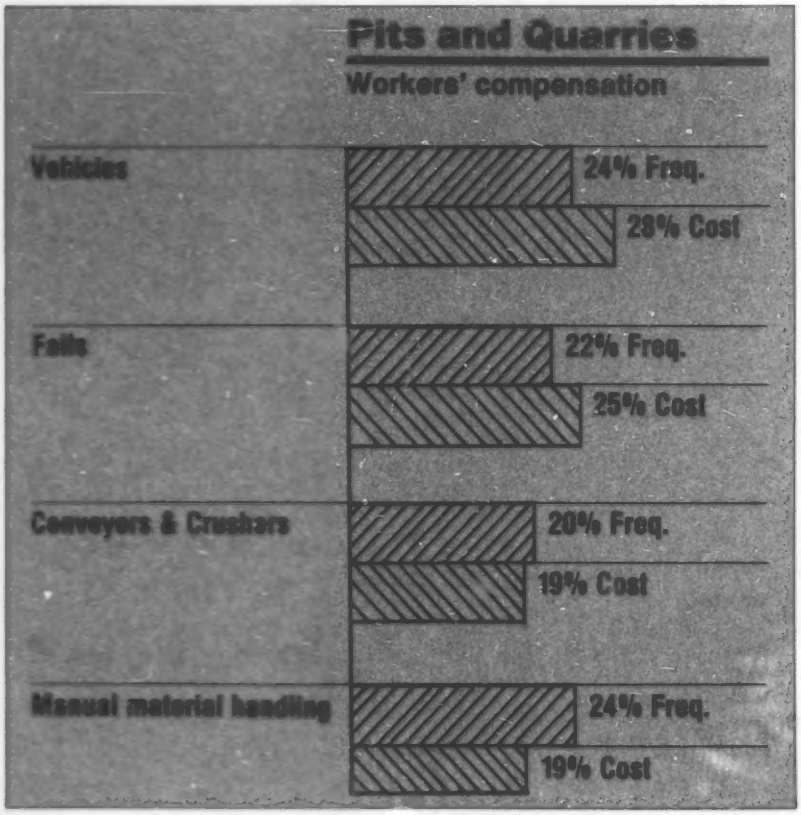
- Is there a lock-out program that is used effectively?
- Are tail pulleys on conveyors guarded?
- Are mechanical drive mechanisms guarded adequately?

Manual material handling--

- Are mechanical assists available where needed? For example, for crusher maintenance?
- Are supervisors aware of ergonomic principles so that task redesign can be considered?

The above questions are a starting point to help quarry management identify their potential for the frequent and serious loss types. By starting with these questions, management should be able to identify the problem areas where money spent for controls should produce the most significant results. ●

This has been an accident cause and prevention discussion furnished by Liberty Mutual.--Ed.



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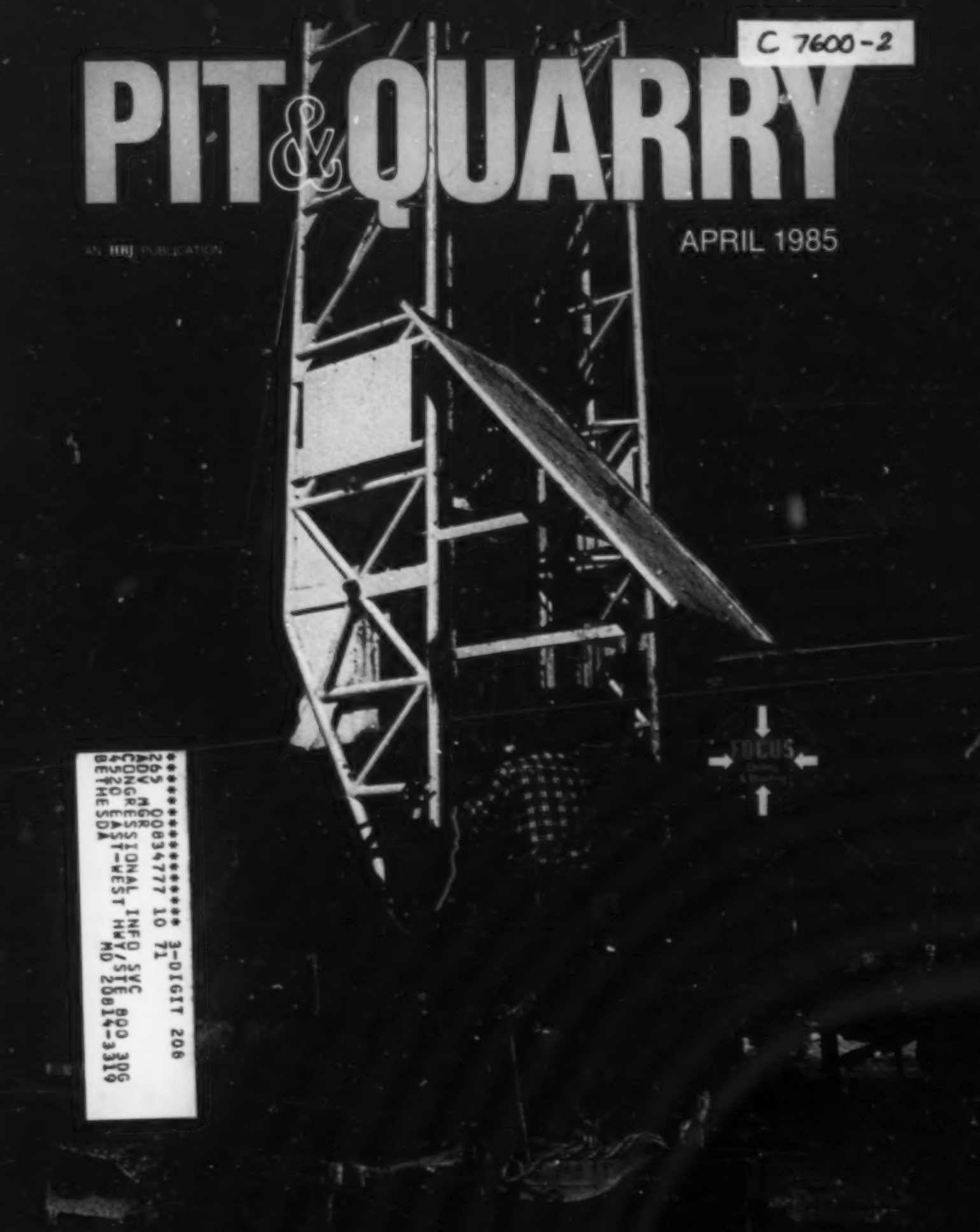
APRIL 1985



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PIT & QUARRY

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ON THIS MONTH'S COVER

Precision drilling is a major contributor to blasting efficiency. Staff photo at Hialeah operation of Tarmac Florida, Inc.

truck topics

edited by Don Michard

Better fuel efficiency reported for truck engine

Caterpillar has announced additional fuel efficiency improvements to 3406B truck engines in the 270 to 320 hp class. The three ratings (310 hp at both 1,800 and 2,100 rpm, and 285 hp at 1,600 rpm) benefit from a package of iron improvements specifically designed to optimize performance and tank mileage for this horsepower class, Cat reports. Improvements include the following:

- New profile hi-lift camshaft provides 50% overspeed protection at 2,100 rpm.
- Low inertia turbocharger improves load response by 40% and startability by 15%.
- A raised ring piston employs a new high compression ratio of 15.2:1.
- Fuel nozzles with new orifice design produce improved atomization and fuel injection patterns for increased combustion efficiency.

Improved response coupled with a 3% gain in fuel economy make these 3406B truck engine ratings highly competitive entries for the fleet and economy segments of the heavy truck market, Caterpillar says. Higher powered versions of the 3406B are scheduled for similar advancements late this year.

Circle No. 148 on Reader Inquiry Card.

It's not too early for summertime maintenance

As winter relaxes its grip, many maintenance crews feel they've survived the worst. After all, vehicles, batteries, and other components seem to find new life when good weather replaces the bad.

Still, it's not too early to think about summertime maintenance programs, according to engineers of GNB Batteries, Inc. That's because hot weather can have an adverse effect on batteries, and no producer wants to be caught with excessive downtime and emergency vehicle maintenance in the middle of a peak production season.

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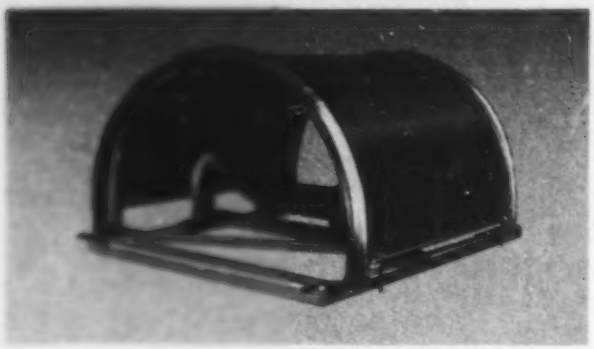

Belt Conveyor Hoods for All-Weather Protection

Ruggedly constructed Belt Conveyor Hoods by S-A are designed to protect belts, materials and idlers from adverse weather. Four fast cover sections are quick opening, easily installed and available in #22 gauge galvanized steel or .040" thick aluminum. Support bands bolt directly to foot brackets for easy installation and lower cost and time of field erection.

For full details and free literature, call or write your local Stephens-Adamson distributor, or Stephens-Adamson, Aurora, Illinois 60507. Phone: 312/892-4311.

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STEPHENS-ADAMSON
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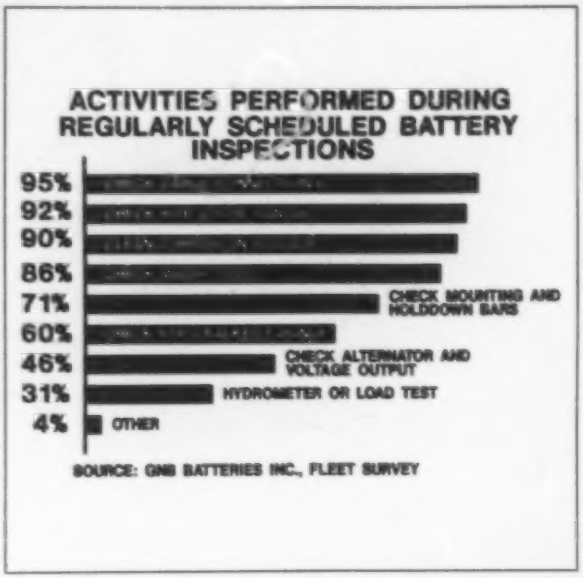
Circle 138 on Reader Inquiry Card

The time to perform careful and comprehensive maintenance on batteries and other critical components is now--or at least before peak operations begin.

Following is a check list of battery maintenance procedures, furnished by GNB Batteries.



How does your vehicle battery scheduled maintenance program compare with other fleet operations? The accompanying chart, furnished by GNB Batteries, Inc., represents responses from 150 fleet operations, coast to coast, to a survey on battery maintenance and purchasing policies.

- Clean battery exterior of salt, dirt, and corrosion. A mild solution of baking soda and water will help. Clean cable connectors also.
- After cleaning, coat the contact surfaces of terminals and cable connectors with mineral grease or petroleum jelly to retard new corrosion.
- Make sure cable connections are bright and tight.
- Replace worn, frayed or cracked cables; they cause electrical resistance.
- Users of conventional antimony batteries should check the electrolyte level and add water if necessary.
- Check holddown bars and make sure all clamps are properly secured. Don't overtighten.
- Check each battery's state of charge; recharge if below 75% of capacity.

Conventional batteries can be checked with a hydrometer. Some maintenance-free batteries do not provide easy access to the electrolyte, so an open-circuit voltage test, or load test may be required. Refer to individual battery testing instructions.

Three points to remember when conducting open-circuit voltage tests:

- Batteries should be at rest at least 2 minutes before open-circuit readings are taken.
- Be sure the voltmeter is in good condition because there can be as little as a one-volt difference between a fully charged and a completely discharged 12-volt battery.
- If the battery has been charged just before test-

Continued on page 58

Continued from page 22

ing (by the alternator, for instance) it probably has developed a surface charge that can influence the open circuit reading. Surface charges can be removed by turning on the vehicle headlights for 1 minute. After turning off the lights, wait 30 seconds before testing the battery.

If using the load-testing option, remember that a battery must be at least 75% charged (equivalent to a 1.230 specific gravity reading or 12.45 open-circuit volts) for the test to be accurate. Be sure to read manufacturer's instructions since load testers come in a variety of styles.

Be careful when working around batteries--during the charging process they generate a highly explosive concentration of hydrogen gas. Charge batteries in an area with good ventilation; keep sparks and flames away. Wear eye protection. If possible, locate the charging station near a washing facility.

Include alternator and voltage regulator in all maintenance checks. Malfunctioning of those components can severly overcharge or undercharge batteries--creating downtime.

If you're storing batteries, check their state of charge every 30 to 45 days. All batteries self-discharge in storage. If they remain partially discharged over long periods, they develop a varnish-like coating on negative plates, making it difficult to return them to full charge again.

Use stored batteries on a first-on-first-out basis, to avoid letting them age excessively. This also protects your manufacturer's warranty. Batteries are warranteed from the date they leave the factory, not the date of purchase.

Check fan and alternator belts for wear and slippage.

Double check battery polarity after installation.

Check for short circuits--they can discharge a battery that is standing idle.

With everything in place, run the engine at fast idle for 10 minutes and use meter to check for alternator and voltage regulator outputs.

Tip: Disconnect ground terminals if vehicles will be parked longer than 10 days. This will eliminate the chance of accelerated self-discharge caused by parasitic electrical loads.

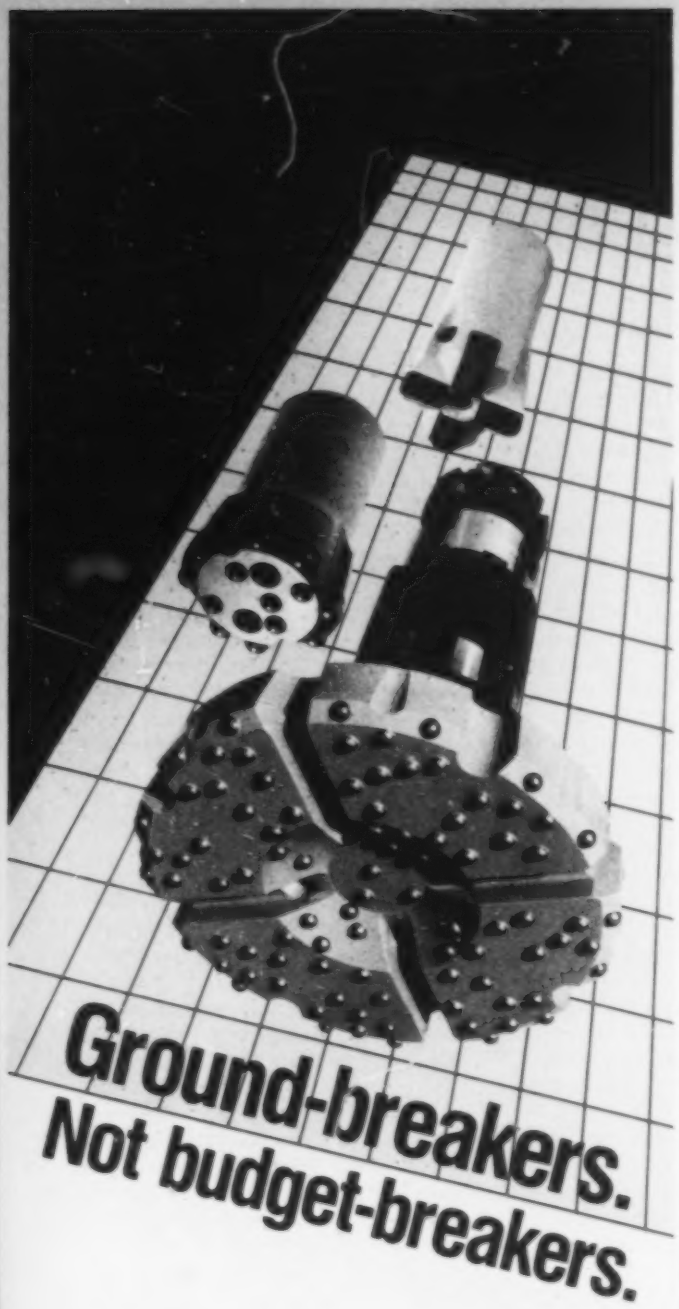
Tandem axle for on & off highway applications

An addition to the 45,000-lb. tandem axle family for on/off highway applications has been announced by the Axle & Brake Division of Eaton Corporation.

Tim O'Boyle, division marketing manager, reported: "Although we have offered the DP451 axles to operators of dump trucks, haulers, drilling rigs, and related equipment, availability was limited to our planetary double reduction gearing. As a response to specific market demands, we have now released a single reduction version--the DS415P."

The DS451 and DP451 are available in ratios from 3.90 to 5.57 and 4.83 to 7.60, respectively, and are specific applications of D401P tandem axles with heavier axle housings designed to support the 45,000 lb. ground loading capacity.

Circle No. 149 on Reader Inquiry Card.



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Circle 128 on Reader Inquiry Card

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PIT & QUARRY

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lama City, Ala., plant of Vulcan Materials (Southern Division) with 8.75 years and 394,589 cumulative accident-free man-hours (N. Burchfield, superintendent); Class B--the Gadsden Plant, Gadsden, Ala., of Heckett with 8 years and 491,353 man-hours (R. Parr, superintendent; and Class C--Plant No. 37, Bethlehem, Pa., of Heckett with 13.5 years and 186,602 man-hours (G. Fulmer, superintendent).

Comparison of 1985/1984 Construction Contract Values*

	1984 Actual ($000,000)	1985 Forecast ($000,000)	Percent Change 1985/84
Nonresidential building	$ 73,328	$ 74,970	+2
Residential building	100,971	108,450	+8
Nonbuilding construction	35,824	37,750	+5
Total construction	$210,023	[illegible]80	+5
Dodge Index (1977 = 100)	148	157	

*Based on statistics compiled by F.W. Dodge Div., McGraw-Hill Information Systems

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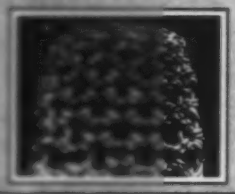

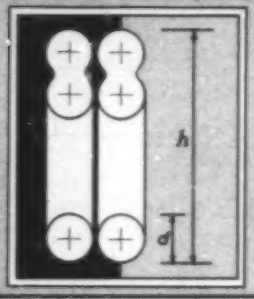

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Coming Events

NATIONAL ASSOCIATIONS

[illegible]

Circle 123 on Reader Inquiry Card

Fluidized bed combustion offers potential markets for limestone

By Jay R. Read, P.E.

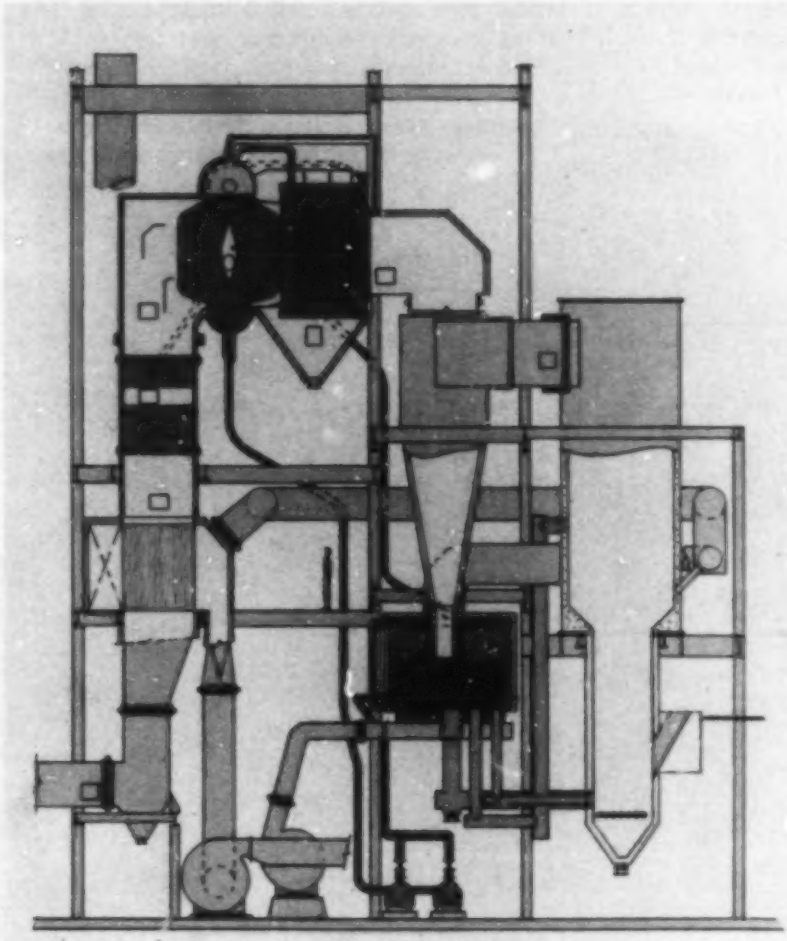
Conventional boilers, which burn solid fuels for generation of steam, usually burn these fuels on a stoker or in burners that mix the pulverized fuel with combustion air. With fluidized bed combustion (FBC), the combustion process is somewhat different. In the FBC boiler, air is blown through a grid plate, a plate full of holes or nozzles, at a sufficient velocity to overcome the weight of the solids on top of the grid plate. The solids, referred to as the bed, consist of the fuel, usually mixed with limestone or sand, that act like a boiling liquid when fluidized.

The amount of fuel that can be burned depends upon the amount of air blown through the bed. When air flow is reduced below the fluidizing velocity, the bed slumps, stopping the agitation and mixing of fuel and bed material. For start-up, liquid or gas fuel is used to warm the bed to a temperature that will ignite the solid fuel, and then the warm-up fuel is turned off.

Steam is generated by ducting the hot combustion gas through a boiler or by tubes located in the bed or by a combination of the two. Water circulated through the boiler and bed tubes is heated to produce steam.

FBC boilers offer a number of advantages over conventional types. Compared to conventional systems, the agitation of the fluidized bed creates higher combustion efficiency and heat transfer for producing steam. Combustion temperatures are rather low (1,500°F to 1,700°F), thus producing lower levels of nitrogen oxides and furnace slag. When limestone is mixed with the fuel in the bed, the sulfur is captured from the fuel, reducing sulfur dioxide emissions and eliminating the need for gas scrubbers. A wide variety of coals and solid fuels can be burned, an advantage that offers good flexibility in fuel purchase or use of waste fuels.

Initial concepts of FBC design usually are credited to work in Germany during the 1920s. Additional development was undertaken in Great Britain and in the United States during the 1950s and 1960s. Current design and development are directed primarily toward combustion of high sulfur coal with reduction of nitrogen oxides and sulfur dioxide from the boilers. Recent sales and installations of coal-fired FBC units, worldwide, have demonstrated acceptable reliability for commercial use of this technology.



Circulating fluidized bed combustion steam generator, 150,000 lb./hr.

Basic types of FBC

Units may be characterized by the velocity of air passing through the grid plate. Low velocity designs, which fluidise the bed without carrying the bed materials out of the combustion furnace, are known as bubbling bed designs. When higher velocities are used, the air flow entrains the bed materials and particles are conveyed out of the combustor and collected in a separate cyclone. This design is known as a circulating FBC because materials collected in the cyclone are recycled to the combustor. Applications for the bubbling bed design are normally in the smaller sizes, under 150,000 lb./hr. capacity, while the circulating bed types show greater economy in the larger sizes. The drawing is of a circulating FBC design.

There are other variables to these basic designs. Some units employ two beds, one for combustion, the second for sulfur capture. Units may be partially shop-assembled or field-erected. Modular designs are available. The boiler or steam generation portion of the unit is designed to suit the particular installation, and may include furnace tubes, drums, convection section, superheater, and economizer. Particulates leaving the boiler normally are collected by a fabric filter baghouse before gases are discharged through a stack.

How limestone is used

For sulfur capture, calcined limestone in the bed reacts with sulfur in the fuel to form calcium sulphate. The limestone is the sorbent and its effectiveness in reducing sulfur dioxide depends upon the characteristics of the limestone and fuel, the combustion temperature, and the molar ratio of calcium to sulfur in the bed. For sulfur dioxide removal in the range of 80% to 90%, the molar ratio of calcium to sulfur generally is in the range from 2 to 4, depending upon other variables.

The reactivity of the limestone and, therefore, the value to the user, depends upon its purity, size, and other qualities. The safest approach to determining if a limestone is a suitable sorbent is to conduct a pilot test on the proposed limestone and fuel. Various FBC designs require different sizes for limestone and fuel. It may be useful to conduct friability studies on the limestone.

Fluidized Bed Boiler Sales in the United States

Date of Commercial Operation	Number of Units	Total Steam Capacity, lb/hr
1973-75	6	120,000
1976-78	16	291,000
1979-81	21	687,000
1982-84	27	1,807,000
1985-87	25	6,416,000
Unspecified	7	1,868,000

(Data condensed from that appearing in *Power*, February 1985)

As an example of the limestone requirements, assume that a 3% sulfur coal requires 80% removal of sulfur dioxide to meet environmental regulations and that an FBC system is used with a calcium to sulfur molar ratio of 2. The system would require approximately 360 lbs. of average limestone per ton of coal burned or approximately 19% by weight.

Sales and installations of FBC systems, starting in 1973, are shown in the accompanying tabulation. While less than half of these installations will use limestone beds (some will use sand or inert bed materials), the list nevertheless indicates a potential for increased limestone use. In general, installations using a low sulfur fuel may not require a limestone sorbent. Some may use both sand and limestone. ●

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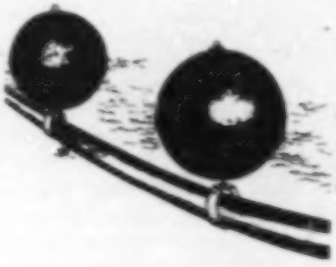

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